REMARKS

Claims 11 to 24 are pending in the application; claims 18 to 24 are withdrawn.

INFORMATION DISCLOSURE STATEMENT

Examiner has refused to consider the non-English language references submitted with the information disclosure statement of 2/10/06 because in examiner's opinion 37 CFR 1.97, 1.98 and MPEP 609 require that a translation be submitted for such references.

Examiner's attention is respectfully directed to MPEP 609.04(a) Content Requirements for an Information Disclosure Statement [R-7], III. CONCISE EXPLANATION OF RELEVANCE FOR NON-ENGLISH LANGUAGE INFORMATION (emphasis in bold added):

"Each information disclosure statement must further include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information listed that is not in the English language. ***The concise explanation may be either separate from the specification or part of the specification.*** *If the concise explanation is part of the specification, the IDS listing should include the page(s) or line(s) numbers where the concise explanation is located in the specification.*

The requirement for a concise explanation of relevance is limited to information that is not in the English language. ***The explanation required is limited to the relevance as understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information at the time the information is submitted to the Office.*** *If a complete translation of the information into English is submitted with the non-English language information, no concise explanation is required. An English-language equivalent application may be submitted to fulfill this requirement if it is, in fact, a translation of a foreign language application being listed in an information disclosure statement. There is no requirement for the translation to be verified. Submission of an English language abstract of a reference may fulfill the requirement for a concise explanation.* ***Where the information listed is not in the English language, but was cited in a search report or other action by a foreign patent office in a counterpart foreign application, the requirement for a concise explanation of relevance can be satisfied by submitting an English-language version of the search report or action which indicates the degree of relevance found by the foreign office.*** *This may be*

an explanation of which portion of the reference is particularly relevant, to which claims it applies, or ***merely an "X", "Y", or "A" indication on a search report****. The requirement for a concise explanation of non-English language information would not be satisfied by a statement that a reference was cited in the prosecution of a United States application which is not relied on under 35 U.S.C. 120."*

Applicant has submitted the international search report listing references 1 through 10 and indicating the relevance as found by the foreign office. The international search report also indicates the pages/paragraphs or figures that are relevant.

Applicant has discussed the relevance of the references 11 through 16 in the specification (pages 2 to 4) and has therefore fulfilled the requirement for a concise explanation.

It is therefore respectfully requested that examiner consider **ALL** references listed on the information disclosure statement.

Claim Rejections - 35 U.S.C. 112

Claims 11 to 12 and 16 to 17 stand rejected under 35 U.S.C. 112, 2nd paragraph, as being indefinite.

The claims have been revised in view of examiner's remarks.

Reconsideration and withdrawal of the rejection of the claims under 35 USC 112 are respectfully requested.

Rejection under 35 U.S.C. 102

Claims 11-12 and 17 stand rejected under 35 U.S.C. 102(b) as being anticipated by *DE 195 26 900*.

Examiner argues in regard to claim 11 that the reference shows generating during roll forming a counterforce relative to the flow direction of the material so that the material flow at least axially and/or radially is controlled in order to integrate the flowing material into the profile to be shaped on the ring. The examiner refers to the tube 1 becoming thicker during roll forming as evidenced by Figures 1 and 2 of the cited reference.

Claim11 has been amended to specify that during the roll forming process an

axial counterforce relative to a flow direction of starting material by an axially arranged counterpressure tool is generated so that a material flow in at least one of an axial direction and a radial direction of the starting material is controlled such that flowing material is integrated into a profile to be shaped on the profiled ring being manufactured.

Please note that Figures 6a and 6b of the present invention show the counterpressure tool 5, i.e., the same tool that is also illustrated in Fig. 2 and in Fig. 5a. This tool 5, as disclosed in the specification, applies an axial counterforce. Please see specification, paragraph bridging pages 7 and 8, where it is explained that the counterpressure tool 5 controls the material flow such that axial material flow is partially hindered and partially guided in the radial direction. In the present invention, the counterforce applied by the counterpressure tool, in the axial direction causes the pipe 1 to assume a slightly greater diameter. This is the basic principle of the present invention and also applies to the process variant illustrated in Figures 6a and 6b.

It is respectfully submitted that Figure 1 of DE 195 26 900 shows that the tube 1 is machined on the exterior side by milling tools 2 and on the interior side by milling tool 3. The thickness is thus reduced in Figure 1 by cutting operation to the desired diameter and thickness. In Figure 2 the inner profiled arbor 5 is shown that applies a force, indicated by the arrow, radially onto the interior of the tube. The outer profiled roller is also forced against the tube 1 radially, as indicated by the arrow. When looking at Figure 3, it is apparent that the thus pre-shaped rings are still interconnected and the separation of the rings takes place in the method step illustrated in Figure 4. There is no increase in thickness; the thickness remains the same; excess material is allowed to flow axially.

In the following a translation of col. 3, lines 28 to 36, of DE 195 26 900 is provided. The translation has been prepared by the undersigned who is fluent in the English and German languages and who certifies herewith that the translation is accurate (emphasis added):

"In the spindle position II the exterior and interior axial pipe roll forming/roll grooving by means of external profile rolling tool 4 and internal profile rolling tool 5 is carried out at the same time in accordance with the external and internal contour of two

rings **whereby practically a closed roll groove is produced and therefore exclusively axial material flow occurs that must be taken into account for pipe advancement.**".

There is no axial counterpressure tool that applies a counter force in axial direction; the material can flow freely in axial direction without there being any axial force counteracting the axial flow.

Applicant would like to stress the point that generally in a rolling process as a result of the tool geometry (rolling tool and rolling arbor) in combination with the tool movement flow of material is effected but not a controlled material flow as in the present invention.

In the cited reference DE 195 26 900 the rolling tool and the rolling arbor are radially advanced toward one another until a "closed roll groove" is produced. Such a closed roll groove is present when the rolling tool and the rolling arbor and the intermediately positioned tube or pipe are contacting one another without a gap existing anywhere. The pipe material that is displaced as a result of the tool geometry flows without being hindered in axial direction, as disclosed in DE 195 26 900. Therefore, the thickness of the tube 1 shown in Fig. 1 does not increase and Fig. 2 does not show such an increase. This is impossible in the employed manufacturing process because there are no means for redirecting the axially displaced excess material flow.

The present invention for the first time presents a means for controlling the material flow during roll forming as desired by applying a counterforce by a counterpressure tool (tool 5 in Figs. 6a and 6b). This tool 5 axially applies a counterforce (i.e., a force opposite to the axial flow of excess material caused by the rolling process) by means of an appropriate (e.g. hydraulic) force-applying system. In this way, the material flow (displacement in axial direction) can be controlled in a targeted way in axial and radial direction by applying the counterforce in axial direction.

The configuration and action of the counterpressure tool is explained in the present invention in connection with Fig. 8 in detail (see page 10, second to last line, to page 11, line 7, of the specification):

"Depending on the size of the pressure of the hydraulic medium 9 in the hydraulic cylinder 8, by means of the hydraulic piston 7 and the counterpressure tool 5

the axial material flow to the pipe end can be reduced or can be "reversed" in the direction toward the clamping location. At the same time, a radial material flow to the outer diameter is enabled in this way. By properly selecting the hydraulic pressure that can be changed during the rolling process the required precision with regard to dimensional compliance, in particular symmetry, of the groove-like profiles is ensured."

Nothing in *DE 195 26 900* suggests or discloses such a counterpressure tool or counterforce action in axial direction that controls the flow in axial and/or radial direction.

Applicant respectfully submits that in forming technology the law of constant volume rules. This means that for axial ring roll forming the initial ring that is cut before the rolling procedure in a separate process from a pipe must have precisely the volume of the final ring to be rolled (e.g. transmission ring or bearing ring) in order to be able to produce the ring by rolling with the required precision without requiring any further machining steps.

When the volume of the initial ring is too small, the final ring will not be completely shaped and therefore it is not usable (scrap).

When the volume of the initial ring is too great the excess material, as can be seen in US 3,867,751 cited by examiner, will flow axially into the free space at the end faces because no resistance exists here. The result is that the rolled ring is too wide and requires therefore extra machining of the end faces in a further separate working step on a separate machine tool.

Even when during axial rolling the geometry of the rolling tools provides a closed roll groove (rolling tools cover end faces), in case of too large a volume of the initial ring the excess material will flow axially which causes the closed roll groove to initially not close completely. The closed roll groove has a gap through which the excess material can flow out. As a result of this, the rolled ring has at both end faces a burr that must be subsequently removed by machining. This scenario happens quite frequently because the law of constant volume (volume of the initial ring = volume of the final ring) requires an extremely high expenditure in regard to manufacturing the initial ring.

When the rolling force is increased up to the point of complete closure of the closed roll groove, rolling tool damage may occur because the excess material has no

escape route.

The above described disadvantages of axial ring rolling are alleviated by the present invention with the proposed axial pipe rolling method: controlling the material flow by axial counterforce applied by means of a counterpressure tool (including the rolling arbor). In this way the law of constant volume is always complied with. The situation that too little volume is available for a ring to be rolled is impossible because the starting material is a pipe, i.e., the starting material is endless (continuous). In case of excess volume relative to the final ring to be produced, this excess material is removed by finish-machining in a processing step on the same machine and in this way the required precision of the final ring is achieved.

Reconsideration and withdrawal of the rejection of the claims under 35 USC 102 are respectfully requested.

Rejection under 35 U.S.C. 103

Claims 11-12 and 17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over *DE 195 26 900* in view of *Connell et al. (US 3,867,751)*.

DE 195 26 900 has been discussed above and reference is being had to this discussion. The secondary reference discloses a method where bearing rings are produced by roll forming a sintered blank. The roll forming process densifies the ring in the bearing area and also causes some flow of the metal in the bearing area to form the final shape of the bearing surface. As can be seen in the illustrations, both axial end faces of the blank during the shaping process are open so that the material can flow axially unhindered and thus uncontrolled. Shaping is controlled only in the radial direction. For example, when comparing the blank 10 in Fig. 1A and the finally produced bearing ring in Fig. 1D, it is dearly apparent that axially the ring has expanded. The same holds true when looking at Figs. 2A to 2D where the blank width is much smaller in comparison to the produced bearing ring 50 of Fig. 1D. This is also expressly set forth in col. 3, lines 1-2, where it is stated that during the forming process the width of the blank increases.

The width increase is enabled because no axial counterpressure tool is present and no axial counterforce is applied that would direct and control the material flow

axially and/or radially.

Therefore, the combination of the references cannot make obvious the invention as claimed as neither one suggests or provides a motivation to employ an axial counterpressure tool and apply an axial counterforce.

Reconsideration and withdrawal of the rejection of the claims under 35 USC 103 are respectfully requested.

ALLOWABLE SUBJECT MATTER

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates examiner's suggestion of allowable subject matter but is of the opinion that the claims as amended define over the prior art without requiring any limitation of the allowable claim 16.

CONCLUSION

In view of the foregoing, it is submitted that this application is now in condition for allowance and such allowance is respectfully solicited.

Should the Examiner have any further objections or suggestions, the undersigned would appreciate a phone call or **e-mail** from the examiner to discuss appropriate amendments to place the application into condition for allowance.

Authorization is herewith given to charge any fees or any shortages in any fees required during prosecution of this application and not paid by other means to Patent and Trademark Office deposit account 50-1199.

Respectfully submitted on July 14, 2010,

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